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ABSTRACT

The discussion of the critical analysis of instructional design is framed within Habermas' three fundamental human interests: technical, practical, and emancipatory. The primary goal of this paper is to explore alternative approaches for instructional designers' reflection and critique. Ultimately, this reflection and critique should shed light on how learning/instruction might be designed. Instead of looking at the comprehensive aspects of instructional design, the focus is on its major theoretical foundations. The general principles of the three interests are summarized based on the theoretical analysis of instructional design. With a deductive approach, implications are drawn from these principles. In order to derive these implications, the following dimensions of instructional design are examined: the knowledge construction process, and the roles of and relationships among resources, learners, teachers, instructional designers, and the client. The relationship between theory and practice, and the social, cultural, and political context and environment of instructional design are also discussed. New perspectives on instructional design include a discussion of: oneness of learning, instruction, and design; transactional roles of learners, teachers, and designers; new perceptions of designers; direct pointing to the problem; and travel across the boundaries. Two tables outline dimensions of Habermas' three fundamental human interests and instructional design with the three interests. (Contains 31 references.) (MAS)

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Title:

Critical Analysis of Instructional Design

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INTRODUCTION

In undertaking the critical analysis of instructional design, we will frame our discussion within Habermas' three fundamental human interests, technical, practical and emancipatory. The primary goal of this paper is to explore alternative approaches for instructional designers' reflection and critique. Ultimately, this reflection and critique should shed light on how learning/instruction might be designed.

Instructional design, as an independent discipline, thrived when Skinner translated behavioral learning theory into programmed instruction in the 1960s (AECT, 1977; Glaser, 1982; Reiser, 1987). Since then, it has been aligned closely with learning psychology, and has been expanding its theoretical constructs by drawing upon communication and engineering theories (Eraut, 1985; Reiser, 1987; Richey, 1993). In the past three decades, its theoretical foundation became oriented toward different paradigms. Instead of looking at the comprehensive aspects of instructional design, we will focus on its major theoretical foundations.

Based on the theoretical analysis of instructional design, we will then summarize the general principles of the three interests. With a deductive approach, we will draw implications from these principles for designing instruction. In order to derive these implications, several dimensions of instructional design will be examined. They are knowledge construction process, and the roles of and relationships among resources, learners, teachers, instructional designers and even the client. In addition, the social, cultural and political context and environment of instructional design will also be discussed.

THEORETICAL ANALYSIS OF INSTRUCTIONAL DESIGN

Focus of design - toward prescription

The discipline of instructional design began at the period when programmed instruction incorporated systems thinking and communication theory in the 1960s. In the following years, instructional design gained more and more recognition in military and business training, especially when Gagne's theory was prevalently adopted by instructional designers. Since then, instructional designers have become more and more ambitious about, and confident of, their capability to make learning efficient and effective by matching instructional methods with learning objectives. Until the time when Gagne's (1985) cumulative learning theory was integrated with design theory, the theoretical foundation of instructional design, which is heavily dependent on learning psychology, was rarely challenged.

Although Bruner declared the need to differentiate descriptive learning theory from prescriptive instructional theory in the 1960s (Glaser, 1982; Clark, 1987), he has not constructed any theoretical guidance for instructional design. However, Reigeluth's (1983) conditions-methods-outcomes framework, which takes outcomes and conditions as givens and prescribes the best methods as variables of interest, exemplifies very clear guidelines for designing instruction at the micro-, mid- and macro-levels. He affirms that descriptive instructional theory with an if-then outcomes orientation can only passively predict what will happen by following certain instructional actions, whereas prescriptive instructional theory, with an in-order- to/ought-to methods orientation, is more rigorous in identifying optimal instruction. A prescriptive instructional theory with adaptable principles, in essence, is intended to provide practitioners, especially novice or incompetent practitioners, with better guidelines for making better instructional choices, judgements and decisions.

Landa (1983) reaffirms that theories and programs of instruction cannot be directly derived from theories and programs of learning because 1) learning theory does not tell anything about which of its propositions should be taken into account and combined in order to state an effective prescriptive instructional proposition, 2) the information provided by learning theories (both descriptive and prescriptive) and learning programs is necessary for building an instructional theory and instructional program, but not sufficient, and 3) in many psychological and pedagogical theories, regularities of learning are viewed as inherent and independent of instructional influences. Following Reigeluth and Landa, Heinich (1984), Winn (1986) and Clark (1987, 1989) also advocate the value of prescriptive instructional theory for

designing instruction. Since then, prescriptive instructional theory has been regarded as a milestone which makes an extraordinary contribution to the theory base of instructional design.

What distinguishes prescriptive from descriptive instructional theory is the spirit of pragmatism, since the former focuses on the actions that could promote instructional efficiency, effectiveness and appeal. While emphasizing the need for prescriptive instructional theories, Reigeluth (1993) also recognizes the importance of learning theories to instructional design. He contends that many instructional designers, such as Gagne, Gropper and Scandura, create both learning theory and instructional theory. The link between the two has been strong. However, in order to provide novice or less competent teachers/instructional designers with help and guidance, prescriptive instructional theories will carry much more weight than descriptive instructional theories. They are tools to be applied, and especially to be adapted, to meet individual needs in different contexts. Such adaptation can be achieved through formative evaluation of a prescribed instructional model or theory. In other words, when a prescriptive theory is constructed, it is expected to be constantly tested and revised in reality.

Goal of design - influence from cognitive psychology

Even though prescriptive instructional theory has elevated instructional design to the state of a more independent field, its major theoretical foundation continues to be learning psychology, which is rapidly advancing. However, Bonner (1988) points out that cognitive psychologists do not necessarily find the link between, or synthesis of, learning and instructional theory satisfactory, despite instructional designers' interest in cognitive theory and their attempts to integrate it into their theory and research. She even indicates some conflicts between the principles of cognitive theory and the practice of instructional design. For example, instructional designers look for practical solutions to training people efficiently, which means quickly and at low cost, while cognitive psychologists are concerned primarily with the study of cognition and learning. Such disparity could be traced to the pragmatic emphasis of prescriptive instructional theory.

Winn (1989) laments that as long as instructional design separates design from delivery, it still operates at a behavioral mode, even though the behavioral objective and outcomes are changed to cognitive terms. He proposes that instructional designers should reflect more upon learning theory. Calls for closer linkage between learning theory and instructional theory are now being frequently voiced (Glaser, 1990; Tennyson, 1990; Hollis, 1991)! After years of effort in establishing instructional design theories and in applying them to training, instructional designers are finding out that their practice is lagging behind the advancement of the sources upon which they once drew. Although Reigeluth (1989) calls for enriching the knowledge base of instructional design, many of the instructional design theories have not yet been revised to incorporate the new findings of cognitive learning theories.

Unlike the 1970s, when instructional theorists successfully used the principles of behavioral learning theories to generate instructional theories, they now have increased difficulties in using advances in cognitive learning theory to generate related instructional principles. One of the major reasons might be that the community of instructional theorists has been endeavoring to apply theories rather than developing theories and consolidating the knowledge base. Efforts expended in constructing instructional theories based on cognitive psychology, such as those to teach higher order thinking, are still inadequate. The theoretical foundation of instructional design is questioned again when constructivism attracts the attention of instructional designers.

Design for constructive learning

While instructional designers are still facing the challenge from cognitivist theorists, constructivism proponents have arrived on the scene. Notably, when the three cognitive psychologists, Collins, Brown and Newman (1989) proposed the cognitive apprenticeship instructional model, some instructional designers started instilling the spirit of this model into their design of instructional materials (Duffy & Jonassen, 1991; Duffy, Lowcky, & Jonassen, 1992). Some instructional theorists are not content to see the distinct line drawn between descriptive and prescriptive theory (Bednar, Cunningham, Duffy and Perry, 1991; Duffy and Jonassan, 1991) and contend that instructional designers should design in context, not in procedures for teachers to follow.

The questions posed by cognitivist theorists and constructivism proponents are quite similar. They both embrace a closer link between learning theory and instructional theory. Since learning theory has evolved from behaviorism to cognitivism to constructivism and even to cultural psychology (Bruner, 1990), instructional theorists undoubtedly will have to struggle with such evolution while constructing their own theoretical foundations if they hope to maintain instructional design as an independent discipline.

Challenges from prescriptive instruction, cognitive psychology and constructivism to the theoretical foundation of instructional design certainly contribute to its evolution. However, looking into the nature of these challenges closely, we can find that many of the arguments about what an instructional theory should be centers on two questions. First, what are the sources upon which an instructional theory can draw? Should instructional principles be derived completely from learning psychology? The second question is, will a prescriptive approach to designing instruction violate the way people learn? We regard the two as separate questions that need to be dealt with independently. By doing so, we can then synthesize the new advancement of learning theories and include other design possibilities with the knowledge base of current instructional design.

New lens for design - critical theories

Unlike the local challenges from the proponents of learning psychology, critical theories seem to provide some alternatives for instructional designers to reflect upon the possible ways for improvement from a more global view. In Paradigms Regained (Hlynka and Belland, 1991), a variety of critical perspectives is introduced to the field of educational technology: Habermas' critical theory, criticism and connoisseurship, semiotics, postmodernism and deconstructivism, and curriculum criticism. Among these diverse critical perspectives, Habermas' theory has been most deliberately applied to the study of instructional design, especially by Streibel.

Habermas (1972) identifies three basic cognitive interests: technical, practical and emancipatory. These interests constitute the three types of science by which knowledge is generated and organized in our society. Grundy (1987) presents a very good interpretation of these three human interests. She contends that technical interest, according to Habermas, is an empirical/analytical way of knowing, with an aim at control and prediction through implementing pre-existing ideas. When we apply it to instruction and learning, we will find that effectiveness and efficiency are the goals for such interest. According to Habermas,

> the type of knowledge generated by empirical-analytic science is grounded in experience and observation, often produced through experimentation. There is a relationship between knowledge and power and between science and technology. Habermas is making a stronger claim that there is a possible relationship between prediction and control. For Habermas the fundamental interest which guides empirical-analytic science is an interest in control and the technical exploitability of knowledge. ..... The technical interest is a fundamental interest in controlling the environment through rule-following action based upon empirically grounded laws (cited in Grundy, p. 10-12).

Practical interest, in Grundy's words, means historical and hermeneutic ways of knowing in which meaning is socially and culturally constructed in the speech acts and practices of interacting human agents. The emphasis here is the meaning-making process rather than the end product of instruction and learning. Grundy (1987) further contends that practical interest is an interest in taking the right practical action within a particular environment and is oriented toward the moral sphere. This is, indeed, consonant with the development of cognitive learning psychology.

As to a critical way of knowing, Grundy maintains that the emphasis is on critical reflection upon social and cultural practices. People become conscious of the pre-understandings in existing social and cultural practices, uncover the contradictions between the ideal of truth, justice, and freedom and actual social and cultural practices, and change social practices. Habermas maintains that

> Although interests are fundamental orientations of the human species, they can themselves be categorized either as being stimulated by inclination or by principles of reason. ..... It is important to realize that interests can also be stimulated by principles of reason. ..... Habermas views persons as intrinsically, or at least potentially, rational beings, so interests which are stimulated by reason are more fundamental than interests which are stimulated by inclination or desire (cited in Grundy, p.17).

Grundy interprets Habermas' fundamental "pure" interest as being grounded in reason, an interest in emancipation. She regards Habermas' emancipation as "independence from all that is outside of the individual and is a state of autonomy and responsibility. More importantly, it is only in the act of self-reflection that emancipation is possible" (p.16).

Streibel (1991) has applied the first two ways of knowing to examining the practice of instructional design, maintaining that the technical human interest approach to theory and practice treats theory as a guide to action. Traditional instructional design falls into this category. If instruction is conceptualized as a set of cultural practices, a social construction and meaning-making process, it operates at the practical interest approach. He further states that instructional designers should find ways to design resources rather than plans for teachers and learners if design is regarded as process rather than product. In his words, "instructional theories should be treated as resources, rather than plans", because "all human practice is situated in an ongoing context that requires continual judgement" (Streibel, 1991, p.851). As a matter of fact, this argument is similar to Winn's belief that the integrity of instruction lies in the fusion of instructional design and implementation during the real time of teaching. From the various perspectives of cognitivist theory, constructivism, and critical theory, it is apparent that why instructional theory should serve as prescriptive guidance for practitioners, either novice instructional designers or classroom teachers, has been a topic for argument in the past decade. Are prescriptive instructional theorists and those who object to the process of prescription really focusing on the same thing, or are they indeed talking about two different issues? When instructional designers incorporate constructivism into their design of classroom lessons or multimedia learning environments, are they following any prescriptions or principles to initiate their design task? Even when designers are designing resources as Streibel recommends, do they not need some guidance on how to design the kind of resources that could enhance the meaning-making process?

It seems that there are two different dimensions of questions intertwined here. What are the educational/training goals that orient instruction or instructional design? What kind of sources do instructional designers draw upon to design instruction? Without keeping these questions clearly in mind and dealing with them independently, the search for a better framework for designing instruction might be futile. Since Habermas' critical theory encompasses all three ways of knowledge construction, we regard it as a valuable source to expand the research and practice of instructional design.

From the above theoretical analysis of instructional design, it is revealing that the development of instructional design has undergone several major theoretical advances. The dimensions of instructional design are broadened every few years, and arguments about the theoretical foundations for design have never ceased. Rather than looking at the evolution from behaviorism to cognitivism to constructivism as a replacement process and viewing these various paradigms as incompatible, we view Habermas' critical theory as a potential source for expanding our vision of instructional design.

ANALYZING INSTRUCTIONAL DESIGN FROM HABERMAS' THEORY OF KNOWLEDGE

In the previous section, it has been indicated that Habermas' theory of knowledge has three forms, or processes, of inquiry: knowledge that is arrived at through empirical-analytic science, historical-hermeneutical science, and critical science. Each of the three requires a different methodology for knowledge construction. According to Koetting and Januszewski (1991), among the three ways of deriving knowledge, critical science aims at deriving analyses that free consciousness from its dependence on hypostatized powers. The task of analyzing instructional design critically is, therefore, targeted at enlightening people's many misconceptions of what instructional design should be. In order to draw implications of Habermas'

framework of human interest on the research and practice of instructional design, we have organized his framework into a two-dimensional scheme by which the various aspects of his theory and its corresponding implications for instructional design could be clearly presented. Table 1 summarizes the various characteristics of each interest.

Implications for Instructional Design

The implications Habermas' theory has on instructional design also have been organized around several themes: (1) knowledge construction process of instructional design, (2) the relationship between theory and practice, and that among learners, teachers, designers and clients. Since this section focuses on generating implications for instructional design, a corresponding table (Table 2) of instructional design with the three interests is presented after Habermas' scheme for better comparison.

Table 1: Dimensions of Habermas' Three Fundamental Human Interests

	Technical	Practical	Emancipatory
1. Basic Orientation	controlling & managing self,other& environment	understanding self,other,& environment	empowering those involved in the environment
2. Focus	product	process	praxis
Goal	explaining, predicting	meaning-making	justice, equality
Outcomes	correct behavior	rational/ moral action	responsible, autonomous action
3. Knowledge Representation	facts, laws, procedures	narrative stories	critical theorems
Knowledge Required	skills	judgement	critique
Knowledge Grounded in	experience & observation	understanding of meaning	critical insights
Knowledge Application& Construction	following rules	making judgement	reflecting upon distorted/taken for-granted views
4. Authority Resides in	plan	practitioner	historical community
5. Role of Theory	theories guiding actions	theories treated as resources for actions	theorems helping construct new knowledge

(Adapted from Streibel, 1991)

Table 2: Instructional Design with the Three Interests

	Technical	Practical	Emancipatory
1. Basic Orientation	controlling & managingthe environment	understanding complexity environment	empowering in a learning environment
2. Focus	instructional product for T's (L's) use	interaction process of t/l	praxis
Goal	prespecify certain learning outcomes	making the learning & teaching process meaningful	restructuring environments that prohibit justice and equality of t/l
Outcomes	correct, prespecified learning outcome	rational/ moral t/l actions	responsible, autonomou learning & instruction
3. Knowledge Represen-tation	facts, laws, procedures	narrative stories	critical theorems
Knowledge Required	skills	judgement	critique
Knowledge Grounded in	experience & observation of t/l	understanding of meaning	critical insights into t/l
Knowledge Application& Construction	teachers following instructional rules	teachers (L) making judgement on own t/l	teachers (L) reflecting upon distorted/taken for-granted views
4. Authority resides in	instructional plans	teachers	teachers' community
5. Role of Theory	instructional theories guiding t/l actions	instructional theories treated as resources for actions	instructional theorems helping T/L construct

Notions of Knowledge

Technical interest: Since designing with the technical interest focuses on attaining prespecified outcomes and intends to derive a certain product, the teaching and learning activities are often planned along with those outcomes. In order to plan these activities in advance, some theories or principles are required for the designers to follow. Such theories or principles are often generated by experiences, or observation and synthesis of a number of teaching and learning phenomena. The result of such design tends to be a prescribed set of instructional methods for teachers' application. These prescribed methods may serve as a lubricant to the completion of a complicated design task at best, and sacrifice the flexibility of design at worst. Hence, these methods have to depend on an early stage of formative evaluation in order not to sacrifice the flexibility and dynamism of learning and instruction.

If a prescriptive theory is intended to be applied by practitioners, it has to be constructed with sensitivity to the ongoing process of teaching/learning, and be embedded with formative research in the generation of theory. That is, formative research should be an integral part of a prescriptive theory (Reigeluth, 1993), and a prescriptive theory can be viewed simply as a blueprint or prototype for another better prescriptive theory, which will not be completed until it incorporates the needs of users within a specific context. While the needs and characteristics of users and the conditions of a context or environment are assessed before instruction, it is also important to continuously diagnose the emergent needs in the course of real teaching-learning interaction.

Practical interest: Therefore, when a prescriptive theory is formed in such a manner, it has more a spirit of the practical interest than of the technical interest. However, the outcomes and conditions of instruction have to be defined and redefined during interaction, not simply interpreted beforehand. Otherwise, it will still be designing with the technical spirit disguised by a practical facade.

As a result, such a move toward the practical interest will encourage practitioners to make their own judgements on what is appropriate for themselves. An instructional theory or a set of principles is hence regarded as a resource for the teachers to adapt and modify their instruction based on their judgement. Designers along with teachers in this circumstance will use their understanding of the processes of teaching and learning to construct their knowledge about learning and instruction, which will better improve their conception and practice of design. What can best capture such a process might be narrative stories that present the richness of the meaning-making process of teaching and learning, since they can inspire the practitioners to make their own judgements.

Emancipatory interest: The emancipatory interest to designing instruction sees the beliefs and ideologies that designers hold as a potential impediment against the empowerment of those involved. Designers who espouse the emancipatory interest hence look into the ideologies dominating themselves and others, and examine how these might prohibit them from carrying out their understanding into actions. When design is penetrated by the ideologies which are identified as viable and applicable without taking into account whose interests are served, genuine justice and equality will not be obtained. Indeed, the extent to which certain ideologies are recognized and accepted often determines the degree to which the existing power relationship and existing interests will be maintained. But how could designers capture their own distorted beliefs and values, and in the meantime, empower those involved to look into theirs in order not to be confined within those social and cultural constraints?

According to Grundy (1987), "one of the fundamental ways in which ideological oppression operates is to make that which is cultural (and hence in principle susceptible to change) appear natural (and hence unchangeable)" (p.104). However, since ideologies, as Grundy contends, are the dominant ideas and thinking of a group or culture, it is often overlooked that our common-sense understandings of reality may involve some unrecognized forms of domination. Emancipation from the predominant ideologies may not be possible simply through processes of reflection, such as those which characterize the practical interest. Emancipation should be built upon continuous reflection upon these beliefs and ideologies.

It is not until design is aimed toward uncovering underlying beliefs and values that we can better rise up from the confinement of ideological oppression. Therefore, the emancipatory design approach constructs knowledge through continuous problematization: "recognizing the problematic nature of

existence is [becomes] essential in order to address questions about the root causes of problematic aspects of life and address possibilities of change" (Grundy, 1987, p.104). The design efforts of the emancipatory interest are not expended on constructing instructional methods for teachers to apply nor on merely encouraging practitioners' judgements about their own teaching and learning. Rather, they will aim at liberating the practitioners from the confinement of any social or cultural taken-for-granted views, focusing on what could be reconstructed, and enabling them to take responsible and autonomous actions.

Since the knowledge construction process of emancipatory design is engaged by not only designers but also teachers and learners, designers could better reflect upon the distorted beliefs through critical theorems.
Grundy explains that

> a critical theorem is a theoretical reconstruction of the undistorted human competencies through which the human species has constituted itself; it is a theory about fundamental human capacities, undistorted by the operation of ideology, which have been the basis for the species' evolution. These critical theorems are implicit in the very nature of human interaction and thus represent a potential for enlightenment and emancipation (1987, pp.111-112).

These critical theorems are also used to assist the teachers and learners to penetrate their own confined views, and reconstruct new knowledge for learning and teaching. Nevertheless, the creation of critical theorems is not the ultimate goal of design for those who hold the emancipatory interest. Following this would be the organization of processes of enlightenment and the conduct of the political struggle, both of which were suggested by Habermas. But how can the designer help teachers and learners become enlightened on the problematic aspects of their learning and teaching?

Design Incorporates Processes of Enlightenment

The design knowledge that is constructed in the emancipatory mode has to be authentic from the teachers' and learners' perspectives, not the designers', since it is they who make sense of whether it is authentic or not. Such authentic knowledge involves practitioners in authentic experiences through critical self-reflection upon personal practice. McTaggart and Singh (1986) claim that

> "critical reflection involves more than knowledge of one's values and understanding of one's practice. It involves a dialectical criticism of one's own values in a social and historical context in which the values of others are also crucial. Criticism itself is, therefore, a relational concept; criticism can only be conducted in a community where there is determination to learn rationally from each other" (p.43).

Since authentic knowledge goes hand in hand with critical self-reflection, the two will orient the teacher and learner toward the processes of enlightenment of their own problems. The constraints that are culturally shaped (and hence are susceptible to change) will be the targets for critical reflection in the design process. Designers, who focus on distinguishing natural from cultural constraints, will hence engage themselves and all others in examining the problematic aspects of cultural constrains. The destiny design leads to is the uncovering of factors that prohibit and prevent the autonomous actions of learning, instruction and design respectively. That is to say, the enlightenment processes are more concerned with the clarification of root problems of learning, teaching and design than with what is to be and how it should be learned, taught and designed. It is a fundamental approach to enabling practitioners to analyze and diagnose their own learning/teaching problems, and to reflect upon why they teach or learn the way they do and what they might reconstruct.

In many cases, instructional designers do emphasize to a large extent the identification of problems. However, such problem identification is often confined within certain parameters. It is within the boundary of such parameters that designers can not free themselves from the historical or social constraints on their practice. There are some cases in which instructional designers do capture the structural tyranny, and realize that fundamental change has to be enacted from the organizational or institutional level. But even so, it is very rare that teachers or learners are involved altogether in examining how their beliefs

and values have been shaped by institutions, and how the institutions in turn have shaped their way of thinking, believing and acting. Therefore, even when instructional designers attempt to identify, analyze and solve problems, it does not necessarily mean they are engaging in critical awareness of their environmental and cultural constraints.

Cosgrove (1982) contends that meaningful learning cannot be separated from autonomous learning. In order to make learning experiences themselves meaningful, the conditions under which learning occurs must be fundamentally changed. This idea has profound implications for design. It is important that instructional designers should not be satisfied with merely identifying the existing conditions and constraints, but they should take a further step to reconstruct the constraints, and to provide conditions under which learning will best occur. To put it differently, designers must improve their understanding of teaching/learning theories; they must also understand the context of learning/teaching, being ready to challenge that context if it prohibits the teacher and learners from becoming autonomous. Designers should also continuously remind themselves that, while acting collaboratively, they may not engage in reflective action at all; the two are not equivalent. To adopt the emancipatory approach to design, any design action must be reflectively generated. The purpose of taking responsible and autonomous actions is to transcend the barriers to such reflection. In one sentence, the enlightenment process, as a major characteristic of emancipatory design, is a continuous problematizing process.

Relationship between Theory and Practice

Based on the above clarifications, we could draw a conclusion that the various approaches to design imply different relationships between theory and practice.

Technical interest: An instructional theory embodying the technical interest is applied as if it were a natural science. "It is assumed in order to guide practice and to test a sounding theory" (Streibel, 1991, p.860). Such design efforts lean toward the side of theory, which is regarded as a higher-level of knowledge. It is revealing that much of the practice of instructional design falls into this category. In many cases, skills acquisition, rather than the process of learning and teaching, has been regarded as the top priority. Many instructional models also focus on the specification of types of knowledge, and optimal ways for teaching. Gagne's conditions of learning and nine events of teaching is a good example of designing learning and instruction with the technical interest in mind. If an instructional designer simply follows his theory to approach a design task, even though he might accomplish an efficient task, he is simply practicing design technically.

Practical Interest: However, meaning is socially and culturally constructed through human interaction, as claimed in the beginning of this section. The practical interest is a fundamental interest in understanding the environment through interaction based on a consensual interpretation of meaning. Therefore, a theory in the practical interest, from Grundy's view, is "judged according to whether the interpreted meaning assists the process of making judgements about how to act rationally and morally in the world" (p.14). With such an orientation of design, theory and practice inform each other, and more important, theory is constructed through the meaning-making processes engaged most of the time by learners and teachers, unless designers themselves play participant observers at a deep and persistent level.

Emancipatory interest: An instructional theory with the emancipatory interest will manifest the ideas of truth, justice and freedom, which are regarded as "transcendental realities within everyday human interaction rather than within some external reality" (Habermas, 1972, cited in Streibel, 1991, p.858). Since emancipation is a potential waiting to be realized in the world of every human being, designers have to first become critically conscious and aware of how they construct their current knowledge in order to realize emancipation. They also need to socially reconstruct their knowledge, beliefs and practices, critically reflect on social and cultural practices, and finally restructure their future actions. The relationship between an instructional theory and practice within emancipatory design, therefore, contains political elements through which teachers' and learners' autonomy and responsibility can be promoted through collective and reflective efforts. The political struggle here lies in the fact that the theory focuses on consciousness of the pre-understandings in existing social and cultural practices. The struggle also attempts to reveal the contradictions between the ideals of truth, justice and freedom, and actual social and cultural practices.

More important, the theory does not simply guide teachers' and learners' action; neither does it assist their judgement-making on their own practice. Rather, it helps designer, teachers and students struggle to change their social, economic and cultural conditions. Such an approach to design will ultimately lead to restructuring the whole learning and teaching system, and the efforts that more and more instructional theorists are making in redesigning the educational system make this possibility viable. The emancipatory design obviously takes into account more fundamental issues about learning and teaching.

Implications on the Relationships between Designers, Teachers, Learners and Clients

The relationship between theory and practice also underlies the power relationships between designers, learners, teachers and clients embedded in the design process. Designers should recognize that the traditions of the division of responsibility and the distribution of power in the work of design are strongly embedded in the histories of designers, their clients, teachers and learners. To examine the existing power relationships in a design task, designers need to locate themselves inside the community of instructional designers, teachers, learners and any other groups which are involved. This is Habermas' (1972) belief that the authority of the emancipatory interest resides in the historical community, not simply a particular group regarded in isolation from its tradition; the social, cultural and historical factors are the essence of such a community. After positioning themselves within the realm of such a historical community, designers will be able to see more clearly how their beliefs and values are shaped; by doing so designers can then transcend the limitations of their current practice and broaden their visions to other design possibilities.

Especially for those who endeavor to restructure the educational system to foster learners' independent and autonomous learning, the recognition of historical community is important. Therefore, within the emancipatory design framework, the designer is no longer the one who designs instruction but the one who is educated in the learning/ teaching processes. The learners and teachers, in turn, while being the targets for liberation, also liberate designers by presenting designers with new insights into their design practice. In addition, the teacher, as stated by Freire (1972), is "no longer the-one-who-teaches, but one who in himself taught in dialogue with the students, who in their turn, while being taught, also teach" (p.53). Freire does not mean that the teacher no longer has any role in the selection of knowledge for study, for the character of liberating education is dialogical not monological. This means that [the designer, teacher and students] all have the right and responsibility for contributing to the process of [learning, teaching and design] (Freire, 1972, p.92).

The instructional designer must assume a new role within this emancipatory framework. When design efforts are oriented toward the emancipatory interest, an instructional consultant rather than an instructional designer will be more appropriate for the task. Using Habermas' (1972) analogy, the instructional consultant will act like a psychoanalyst, whose dialogue with his/her client focuses on self-enlightenment and problem-solving. It can be said that the instructional consultant will not only think and act in a dialogical and reflected mode, but also negotiate with any party line which may prohibit the reconstruction of cultural and social constraints on the processes of learning and teaching. The ethical and moral responsibility is a new dimension for consideration. Similar to those who engage in educational systems redesign, efforts are expected to be expended on overcoming the political, social, cultural and environmental barriers embedded within the system.

From the above description, it is obvious that much practice of instructional design still embodies many characteristics of a technical nature. Many people have now started to design their instruction by focusing on the resources or learning environment, which can provide learners with a greater space for navigating and inquiring. Applying constructivism and situated learning to instructional design is no longer a dream. Vanderbilt group's anchored instruction and Duffy and Jonassan's (1993) design of a constructivist learning environment both demonstrate such a possibility. Another example is Tripp and Bichelmeyer's (1991) rapid prototype, in which learning/instructional goals and methods are selected based on the continuous interaction among the designer, teacher, learners and the client. However, while there are more and more design issues brought up to accommodate the practical interest, interest in the emancipatory design has not yet been widespread. Moreover, these design models or approaches embody elements of more than one interest. Our contention is that Habermas' three knowledge interests are not supposed to dominate our thinking and action in a clear-cut manner. Although one particular interest may dominate our decision-making process and actions, we do not have to be restricted to it if the other two have value.

ASSUMPTIONS FOR APPLYING THE THREE KNOWLEDGE INTERESTS TO DESIGN

How Do the Various Interests Orient Our Actions?

The first question we need to ask is, do Habermas' three knowledge interests always operate in insolation or interact to some extent within our cognition and action? Although it appears that each of the three fundamental human interests has a distinct set of characteristics, we need to inquire, in reality, whether our cognition and actions fit neatly into simply one interest or another.

Living in this postmodern society, pluralism and multiplicity have received great attention and are widely discussed in education. People always have different intentions, expectations and attitudes when approaching a task. Even for the same person, he/she might have various intentions and expectations of, and attitudes toward, various tasks, at different stages of his/her life. Although Habermas (1972) argues that the emancipatory interest is the highest form of human rationality, it is not, in fact, the only interest dominating every action we take. Our lives are multi-dimensional, and hence at different times and in different situations we often take different actions.

Design tasks are human activities complicated by many social, cultural, and even political and economic interplays. A design task often involves various domains of problems to be solved, which requires different types of knowledge and actions. We may have an ultimate goal guiding our action, but in order to achieve that goal, we might need to undertake various kinds of efforts. Design is usually conducted and carried out through diverse considerations; a designer often needs to negotiate among different stakeholders. Toward which of the three interests a design task is oriented is thus influenced by these considerations.

What Are the Relationships among the Three Interests?

When looking into the relationship among the three interests, Grundy (1987) maintains that while the practical interest is compatible with the emancipatory interest, the technical interest is not. Does this mean that the practical and emancipatory interests might orient one's cognition and action simultaneously, but not the emancipatory and the technical? Or could the technical interest operate at a different level from the practical and the emancipatory? If only two of them can coexist, does it preclude the application of the third one?

Theoretically, the three interests are different from one another in many domains. But realistically, each of the interests exerts different degrees of influence on people's thinking and action when they engage in a task. After all, is the technical interest a preparation for, or inhibition of, the practical interest? Will the practical interest naturally lead to the emancipatory interest because of their compatibility? Do people only need to adopt one interest to solve different problems? Or do the three interests indeed operate at various levels?

Is Any of the Three Interests Worse than Another?

In answering the above questions, we have to ask a relevant question: Is any one of the three interests inherently worse than another when it dominates the practice of instructional design? Or is emancipatory design always the best? If we think the practical interest is better than the technical, then we should direct our efforts toward the practical mode of thinking and action. Similarly, if we agree that the emancipatory interest is the highest form of human rationality, as justified by Habermas (1972), and believe that it should always direct our actions, then we certainly should eliminate any possible actions that serve either the technical or practical interest. Habermas seems to value the emancipatory interest more than the other two when maintaining that it has the purest rationality. However, when we apply it to the analysis of instructional design, does it mean we should completely abandon the kind of design practice that is dominated by the technical or practical interests?

The Significance of Taking into Account All Three Interests

The significance of taking all three interests into account while engaging in a design task is that we need more alternatives to broaden our vision of design, and expand our considerations about design in the complex human arena. If we limit ourselves to only one single interest, we will lose sight of other possibilities. The critical point is our ability to determine which mode of actions to take when coping with a certain problem. It is also essential to identify the conducive situations for each of the three interests to play. More important, the kind of efforts required by each interest should be recognized.

In the evolution of any discipline, we could find that new ways of thinking and doing always gain popularity when they are more accountable to some phenomena than the old ones. Nevertheless, even though our knowledge keeps advancing, there remain some aspects of human activities which could still be better done in the old ways. While we should not let the old paradigms of thinking prevent our progress, we may not make a wise decision when trying to replace everything with a new paradigm. The purpose of looking at the values, weaknesses and strengths of each of the three interests in determining designing efforts is to incorporate as many design possibilities as is useful. We need to have a larger repertoire to accommodate the needs of a wider range of contexts. Moreover, the routes to the highest goal are many; we need to identify as many of them as possible, rather than choosing only one route.

NEW PERSPECTIVES ON INSTRUCTIONAL DESIGN

In the previous sections, we have provided critical perspectives on the practice and research of instructional design. We first have summarized the various dimensions of Habermas' three fundamental human interests into a table so as to draw implications for instructional design. However, we have only focused on the notions of knowledge, the relationship between theory and practice and the relationships between designers, teachers and clients. The main purpose of such a critical analysis has been to inquire how the three interests might be applied to the design of learning and instruction, and why it is essential to take all three interests into account. More important, the analysis serves to generate a set of new perspectives for instructional design.

Oneness of Learning, Instruction and Design

Traditionally, learning theories, instructional theories and instructional design theories are treated as three distinct entities. While the numerous arguments about whether instructional theories can stand alone from learning theories are made, recent exploration of cognitive psychology provides a great deal of insights into the possibilities of integrating the two. However, beyond the integration of learning and instruction there is a certain point where learning, teaching and design can come together. That is when learners, instructors, and designers engage all together in reflective and critical thinking to explore the fundamental problems from diverse perspectives. It is our belief that instructional designers or teachers should be particularly reflective and critical in thinking and dialectic in interacting, and respect a world of plurality instead of certainty and control, so that a journey of instructional design will be redirected to unlimited possibilities.

Transactional Roles of Learners, Teachers and Designers

Instructional designers who have taken for granted that their knowledge of instruction exceeds that of many teachers need to reflect on the complex interactions between learning and instruction. Learners should be given the responsibility to direct and manage their own learning. When they become self-teachers, they will be more creative. In addition, teachers' ongoing self-awareness and self-reflection will enable them to perceive instruction in a dynamic way; teachers' and learners' reflection will allow them to make decisions about the kinds of instruction and learning appropriate for learners. The mission of instructional designers is to enable teachers to reflectively design instruction that can empower students to design learning for themselves.

In a learning-centered environment, instructional designers will be the backstage heroes, assisting learners and teachers to become the main actors of the learning drama rather than controlling the learning environment. All learners, teachers and designers should engage in the process of learning and deepen their understanding of the purpose of teaching and design. Knowledge about learning theories or instructional theories, or even design theories is not the privilege of any one of these groups, although the extent to which they need to know these varies from one group to another. Designers should not limit themselves to the task of design. With a deep understanding of the complexity of teaching and learning, and insights into human nature and potential, designers will no longer confine themselves within a certain paradigm or approach, but continuously explore new possibilities. In summary, the new role of the instructional designer is transactional with that of learners, teachers and client in both the local and general contexts.

New Perceptions of Designers

Instructional designers need to recognize the uncertainty in any design context, since reality is constantly changing. A mindset that can accommodate such uncertainty must be cultivated. They should have the ability to grasp the wholeness and originality of the phenomena they observe without projecting their own personal biases. By doing so, they can see and detect the hindrances in learning and teaching, and hence find an appropriate way to loosen them. They also should make keen observation of the learning context so that they can adapt their design whenever it is necessary. Their readiness for adapting design approaches is very important. With these capabilities, instructional designers can play several different roles.

The roles an instructional designer can play are many. In the critical analysis section, we have pointed out that when an instructional designer practices the emancipatory approach, he/she is no longer an instructional designer but a consultant who is concerned with more than the content of learning and teaching. The consultant is like the psychoanalyst who helps his/her clients to discover their own problems and assumes responsibility to solve them. He/she will focus on ways of enlightening teachers/clients.

Indeed, if an instructional consultant has a philosopher's curiosity about what life really is, a psychologist's insights into human emotions and personalities, and a sociologist's concern with the complex relationships entangled in our reality, he/she will expand his/her own repertoire for design. Designers need to learn to think like historians, anthropologists, inventors, and even artists. This does not mean designers have to master the knowledge of every discipline. What is proposed here is a new perception and expectation of, and new attitude toward, what we have being calling "instructional designers".

As argued earlier, skills for design are important, but critical insights are what advance the discipline of instructional design. Designers should not only focus their attention on the processes of learning and teaching, but on the social, political and economic impact on these processes. Even the most advocated view among instructional designers, a systemic approach to design, requires designers to continuously reexamine their relationships with others who are also involved in learning and teaching. Within the larger system, the instructional consultant should not only think and act in a dialogical and reflective mode, but also negotiate with any party line which may prohibit the reconstruction of cultural and social constraints on the processes of learning and teaching. This ethical and moral responsibility presents a new dimension for consideration, and efforts should be made to overcome the political, social, cultural and environmental barriers embedded within the system.

Direct Pointing to the Problems: from Problem-Solving Design to Enabling Design

When an instructional consultant assumes more social responsibilities, the ultimate goal of instructional consultation is no longer solving some particular teaching or learning problems. It is to enable learners or teachers to diagnose problems for themselves, and search for solutions to these problems. More fundamentally, the consulting process is a continuous and ongoing problematizing process. The root

causes of the problems are traced not only to actions, but also to one's ideology and beliefs. The purpose is to uncover factors that prohibit and prevent the autonomous actions of learning, instruction and design, respectively. It is a fundamental approach to enabling practitioners to analyze and diagnose their own learning/teaching problems, and to reflect upon why they teach or learn the way they do and what they might reconstruct.

Much of the current emphasis on problem analysis in the process of design still operates at a superficial level. It is often confined within certain parameters, within which designers could not free themselves from the historical or social constraints on their practice. Especially when politics is involved, proposed solutions to the problems often end up conforming to those who have the power to make decisions. Therefore, the move from a problem-solving design to an enabling or empowering design requires us to look into the depths of a problem in order to find the fundamental causes prohibiting one's ability to undertake the problem independently. Such a role for the instructional consultant will demand more discipline.

Travel Across the Boundaries

An instructional consultant should be able to travel across the boundaries of the three approaches to design. The three approaches suggested in this study could provide us with more design or consultation considerations. While we should not resist the guidance of theories or principles, we should always look into the limitations of each of the approaches. Some of their limitations may be inherent, embedded in the underlying assumptions of the approach. However, many more limitations are imposed by those who undertake them if they are not able to flexibly apply these approaches, or elevate themselves beyond the boundary of a particular approach.

But to be able to freely and creatively use the three approaches, an instructional consultant would regard skills or methods as merely stepping stones for learning and teaching. Skills which are identified as good and useful will be changed, and even discarded at certain points in time, so that new skills can be constructed. The purpose is not to demean skills, but to point out the limitations of them, since too much emphasis on skills tends to prevent learners and teachers from searching for other possibilities. Learning can be constructed, deconstructed and reconstructed again. There are no fixed rules for learning or teaching. Without such an understanding, it will be approached always within the skill paradigm.

Instructional design, in the new light through Habermas' knowledge framework, demands the cultivation of visions and perspectives, and requires humanistic concerns and more discipline. In addition to familiarity with the three design approaches (technical, practical and emancipatory), practitioners who wish to design practically and critically have to possess the capability to grasp the situational and dynamic nature of learning and teaching. Those who have practiced design for a long time may not necessarily be better than the novice in applying design if they are confined within their long-held design beliefs, resisting new possibilities and new visions of design. They should also learn to see a design task holistically and situationally, without segregating learners from teachers and designers, or even the process of learning from teaching and design. Considerations of design are based on broader and deeper foundations. Methods of learning, teaching and design are simply tools to reach the ultimate goal; they are means, not ends, of design efforts. Therefore, design should not end with the construction of methods for application. In the process of instructional design, designers should committ themselves to transforming reality when necessary, not simply to designing a learning/teaching task. However, we should recognize that methods are vitalized by those who use them, not the other way around. Methods themselves have no life; it is the person who knows when and how to use which methods so as to make a certain approach more appealing than others.

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